



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,515	03/30/2004	Yoshinori Watanabe	P/1929-92	3307

2352 7590 09/18/2007
OSTROLENK FABER GERB & SOFFEN
1180 AVENUE OF THE AMERICAS
NEW YORK, NY 100368403

EXAMINER

SAMS, MATTHEW C

ART UNIT	PAPER NUMBER
----------	--------------

2617

MAIL DATE	DELIVERY MODE
-----------	---------------

09/18/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/812,515

Applicant(s)

WATANABE ET AL.

Examiner

Matthew C. Sams

Art Unit

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/11/2007 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3-10 and 12-20 are rejected under 35 U.S.C. 103(a) as being unpatentable by Deneire et al. (US-6,990,061 hereinafter, Deneire).

Regarding claim 1, Deneire teaches a radio wave propagation characteristics estimating system for determining a frequency transfer function of a radio wave by estimating radio wave propagation characteristics, the system comprising:

a ray tracing unit to trace (Col. 10 lines 38-45) courses of a plurality of rays approximating a radio wave radiated from a transmission point and detected arriving at a reception point; (Col. 10 lines 39-45)

a frequency determination unit operable to divide a spectrum of a radio signal of a target radio communication system into a plurality of bands (Col. 12 lines 26-39) and determine a frequency transfer function (*i.e.* fourier transform of an impulse response) of a predetermined frequency of each of said plurality of bands by said radio wave propagation characteristics estimation, said predetermined frequency of each of said plurality of bands being used as a frequency of the radio wave radiated from said transmission point; (Col. 12 line 40 through Col. 13 line 17) and

an estimation unit operable to estimate the radio wave propagation characteristics of said target radio communication system on the basis of the frequency transfer functions determined by said frequency determination unit. (Col. 10 line 29 through Col. 11 line 20 and Fig. 1) Deneire does not explicitly recite the estimation unit combines the determined frequency transfer functions of the plurality of bands, however it is obvious to one of ordinary skill in the art that the Deneire has to be combining the frequency transfer functions of the plurality of bands because Deneire explicitly recites the ability to deal with "multi-carrier channels" that have a plurality of different carrier frequencies (Col. 3 lines 2-30 and lines 33-42) and to "Transform Reference Tones into Intermediate Results" (Fig. 12 [700]) and then "Transform Intermediate Results into a Channel Estimate". (Fig. 12 [720])

Regarding claim 3, Deneire teaches a third step of acquiring information on the arrival delay time (Col. 10 lines 41-45 and Col. 11 lines 21-33) and intensity of each of the rays arriving at said reception point for each of said predetermined frequencies by estimating said radio wave propagation characteristics and determines the frequency

transfer function for each of said predetermined frequencies on the basis of the information acquired by said third means. (Col. 10 line 29 through Col. 11 line 33, Col. 11 line 65 through Col. 12 lines 19 and Col. 12 line 26 through Col. 13 line 17)

Regarding claim 4, Deneire teaches the acquiring unit acquires information for each of said predetermined frequencies by tracing the courses of said plurality of rays only once. (Col. 10 lines 39-45)

Regarding claim 5, Deneire teaches the acquiring unit is provided for each of a plurality of directions to which the rays are radiated from the transmission point so as to carry out in parallel. (Fig. 1 & Fig. 5)

Regarding claim 6, Deneire teaches the number of a plurality of said predetermined frequencies is set on the basis of the extent of the spectrum of the radio signal. (Col. 12 lines 26-33)

Regarding claim 7, Deneire teaches the extent of said spectrum of radio signal is the bandwidth of the spectrum of the radio signal. (Col. 12 lines 26-33)

Regarding claim 8, Deneire teaches the extent of said spectrum of radio signal is the band distribution of said spectrum of radio signal. (Col. 12 lines 26-33)

Regarding claim 9, Deneire teaches eliminating noise from the analyzed spectrum. (Col. 7 lines 6-45, specifically lines 18-20)

Regarding claim 10, the limitations of claim 10 are rejected as being the same reason set forth above in claim 1.

Regarding claim 12, the limitations of claim 12 are rejected as being the same reason set forth above in claim 3.

Regarding claim 13, the limitations of claim 13 are rejected as being the same reason set forth above in claim 4.

Regarding claim 14, the limitations of claim 14 are rejected as being the same reason set forth above in claim 5.

Regarding claim 15, the limitations of claim 15 are rejected as being the same reason set forth above in claim 6.

Regarding claim 16, the limitations of claim 16 are rejected as being the same reason set forth above in claim 7.

Regarding claim 17, the limitations of claim 17 are rejected as being the same reason set forth above in claim 8.

Regarding claim 18, the limitations of claim 18 are rejected as being the same reason set forth above in claim 9.

Regarding claim 19, the limitations of claim 19 are rejected as being the same reason set forth above in claim 1.

Regarding claim 20, the limitations of claim 20 are rejected as being the same reason set forth above in claim 1.

4. Claims 2 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deneire in view of Hill (US 2001/0006006).

Regarding claim 2, Deneire teaches the estimation unit filters the frequency transfer functions determined by said frequency determination unit with band pass filters having pass bands respectively corresponding to the plurality of bands obtained by dividing the spectrum (Col. 8 line 8 through Col. 9 line 12 and Col. 12 lines 26-39) and

transforming the combined results into a channel estimate (Figs. 11-13, Col. 3 lines 2-30 and lines 33-42), but differs from the claimed invention by not explicitly reciting the arranging and synthetically combining the filtered frequency transfer functions on a frequency axis.

In an analogous art, Hill teaches a contact sensitive device that tracks the motion of a stylus on a touch sensitive screen through ray tracing and Fast Fourier Transforms and shows frequency transfer functions on a frequency axis. (Fig. 10a - Fig. 10d) At the time the invention was made, it would have been obvious to one of ordinary skill in the art to implement the estimation of wave propagation characteristics of Deneire after modifying it to incorporate the graphical representations of the results of Hill. One of ordinary skill in the art would have been motivated to do this since the results of varying frequencies and the interference of reflections (constructive and destructive) can be seen visually. (Page 7 [0123])

Regarding claim 11, the limitations of claim 11 are rejected as being the same reason set forth above in claim 2.

Response to Arguments

5. Applicant's arguments filed 6/11/2007 have been fully considered but they are not persuasive.

In response to the applicant's statement regarding page 5 of the Final office action (Applicant's arguments Page 10), the examiner disagrees.

Upon a further review of Deneire, Deneire has to be combining the frequency transfer functions of the plurality of bands because Deneire explicitly recites the ability to deal with "multi-carrier channels" that have a plurality of different carrier frequencies (Col. 3 lines 2-30 and lines 33-42) and to "Transform Reference Tones into Intermediate Results" (Fig. 12 [700]) and then "Transform Intermediate Results into a Channel Estimate" (Fig. 12 [720]).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Sams whose telephone number is (571)272-8099. The examiner can normally be reached on M-F 7:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid can be reached on (571)272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2617

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MCS
9/13/2007



LESTER G. KINCAID
SUPERVISORY PRIMARY EXAMINER